Anchor Practice

New exploration

Version 0.1.2 (Draft)

When a new pitch or other vertical feature is found whilst exploring new passage, there is often a fever to explore and survey as quickly as possible. However, if the explorers are lucky enough to discover significant or interesting cave beyond there is a real likelihood that the obstacle will need to be passed by many other cavers in the future.

Good rigging often can only be done in very limited places, so the placement of the ‘exploratory’ anchors is important as they may reduce the possibilities for future rigging.

With this in mind the following has been drafted as a guide.

Whatever anchors are placed, at some point they will wear out or corrode. A method of replacing the anchor at the end of life is important, as often they will be in the best place for future anchors. Some types of anchor form a tension cone whether loaded or not, others form this only when loaded. As a result, anchors need to be a suitable distance away from other anchors. This distance varies with the type of anchor.

Current best practice is to use resin anchors as, if chosen well, these can be removed and the hole reused. This document is written on the assumption that the vertical obstacle will eventually be rigged with British Caving Association (BCA) approved resin anchors.

Descending Vertical Obstacles

The following is the preferred method of rigging a pitch discovered while exploring:

 1. Use of natural belay points.

 This causes very little damage leaving a clean canvas to work with, but natural belays should be chosen with care for safety reasons and not to damage the scientific and aesthetic value of the passage.

1. Petzl Pulse anchors or equivalent.

 These require an eight or twelve millimetre hole and the anchor can be removed on every trip if required. This leaves minimal damage to the pitch head and might be suitable for long term rigging if the pitch is very rarely visited. Although not cheap, most exploration on Mendip uses explosives and when compared to that cost it is likely to be far cheaper per metre of passage.

1. Concrete Screws.

 Various sizes are available, but do not work well in some limestone. These can be removed and the hole used for something else.

1. BCA approved resin anchors.

 If done correctly this would be ideal. Modern resins are very quick to set and come to full strength, so could be used on the same trip**. However, the final best anchor placements may not be apparent until sometime after the anchors are first required for exploration to continue, therefore due consideration should be made for future anchor placements.**

1. Removable rawl bolts.

These have been used for many decades, however the hole needed is very large, but could be reused for resin anchors. The knowledge of this use is limited.

1. Spits or equivalent.

 Although these do produce a cone of tension when not loaded, their small size (10m for drilled drop in and 12mm for hand drilled) means that they can be drilled out with a core bit and the tension removed allowing either the hole to be reused or a very close location used instead.

1. Through bolts

 Anchor should be chosen with a consideration to future removal. While remaining suitable for the rock conditions, thinner and shorter tends to make removal easier, stainless steel is harder to drill through. The holes should be always over-drilled to a depth where the bolt can be fully knocked into the rock to remove the tension and hide the anchor. Hopefully this is not what will be done, as it leaves a piece of corroding metal in the rock with unknown consequences. The over-drilling aids removal, however it is still difficult and not always successful.

What not to use

 Anchors that come with a built in plate that cannot be removed are extremely difficult to remove. If they are the type that tensions the rock, it is often not possible to relieve this tension, therefore producing a larger area that cannot be reused. It is also known that certain resin anchors, the helical ones in particular, are extremely difficult to get out and often damage a very large area when removed.

Aven climbing

This often requires a large number of anchor placements, many of which will not be reused. Exploration should be done with the aim of leaving behind the least amount of equipment, preferably nothing. The anchors used for the climb should be removable and should be removed when the exploration of the aven has been concluded with the only anchors remaining in the cave being the anchors used for descent if natural belays are not available.

Andrew Atkinson

CSCC Equipment Officer

January 2024